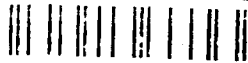


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**PRESERVING THE U.S. MILITARY TECHNOLOGICAL EDGE:
A LONG-TERM MILITARY-INDUSTRIAL-ECONOMIC STRATEGY TO EXPAND
THE U.S. MILITARY TECHNOLOGICAL EDGE INTO THE 21ST CENTURY**

BY

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STRATEGY TO EXPAND THE U.S. MILITARY
TECHNOLOGICAL EDGE INTO THE 21ST CENTURY**

AN INDIVIDUAL STUDY PROJECT

by

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A comprehensive military-industrial-economic strategy is critical for improving U.S. defense and industrial abilities to research, develop, and produce advanced systems. Desert Shield and Desert Storm raised concerns about the U.S. capability to produce advanced weapons systems for future combat operations because many critical parts of U.S. weapons are increasingly being designed by foreign companies. U.S. industries appear to have an extremely difficult time transferring early technological leads into profitable, non-defense, commercial products and seem to miss opportunities to produce high technology products for domestic and international consumption, resulting in a further erosion of the U.S. industrial base. The diminished U.S. industrial base, in turn, makes it more difficult for the U.S. to produce weapons systems efficiently and reconstitute combat forces should a large force be required to resolve a crisis. This study focuses on finding a better way for the Department of Defense (DoD), industry, and congress to cooperate toward creating a more viable technological and industrial base to support both national defense and economic interests.

INTRODUCTION

A comprehensive military-industrial-economic strategy is critical for improving U.S. defense and industrial abilities to research, develop, and produce advanced (leading edge of technology) systems. Desert Shield and Desert Storm raised concerns about the U.S. capability to produce advanced weapons systems for future combat operations because many critical parts (including high-tech portions) of U.S. weapons are increasingly being designed and produced outside the U.S. Additionally, U.S. industries, including defense contractors, appear to have an extremely difficult time transferring early technological leads into profitable, non-defense, commercial products. U.S. corporations seem to miss opportunities to produce high technology products for domestic and international consumption and thereby decrease long-term opportunities to strengthen the U.S. industrial base. The diminished U.S. industrial base, in turn, makes it more difficult for the U.S. to produce weapons systems efficiently and reconstitute combat forces should a large force be required to resolve a crisis.

This study is directed toward finding a better way for the Department of Defense (DoD), industry, and congress to cooperate toward creating a more viable technological and industrial base to support both national defense and economic interests. The study first focuses on major trends in U.S. technological and industrial capabilities and forecasts future capabilities should

the U.S. fail to act. Next, economic policies and strategies of Japan, which have achieved impressive gains in technology and productivity, will be reviewed for inclusion in a proposed U.S. strategy. Third, U.S. government and industrial initiatives which appear to hold promise for improving U.S. capabilities will be discussed. Based on these reviews, the final section offers a U.S. military-industrial-economic strategy to achieve a higher level of defense preparedness and national economic prosperity.

MAJOR TRENDS AND A FORECAST FOR THE FUTURE

The gradually declining capability of the U.S. to develop and produce military products efficiently is a disturbing trend. The situation appears worse when considering the fact that the U.S. cannot economically or politically sustain high defense budgets at a time when the U.S., Japan, and the European Community (E.C.) compete on a relatively equal basis.¹ Congress has already acted to reduce future defense budgets because of the drastically reduced likelihood of military confrontation with the Soviet Union. In recognition of these factors, the U.S. military strategy is changing.

Military Strategy

The strategy under development is based on forces being able to respond to five general scenarios in which they might plausibly be required to deploy and fight. These scenarios range from peacetime engagement to global conflict, with primary stress on major regional contingencies.² Success relies on smaller, yet very capable, well-equipped forces able to achieve U.S. national objectives quickly and decisively. The strategy recognizes that the U.S. will have to respond to any conflict beyond the short scenario by reconstitution of well-equipped forces. The 1991 Joint Military Net Assessment concludes that the revised defense program "provides minimum capability to accomplish national security objectives."³ The program has a number of weak spots

resulting in an overall assessment of moderately high, but acceptable risk. This assessment assumes most future military conflicts can be handled by relatively small standing forces with existing stocks of military supplies, and warning time and industrial preparedness will be sufficient to mobilize expanded forces for major conflicts.⁴ The Joint Chiefs project it will take six to twenty-four months before mobilization of the industrial base or surge production will begin to deliver critical components.⁵ This new strategy decreases the U.S. ability to equip the force during peace and war.

Defense Budget

The U.S. defense budget translates into long-term decreases in acquisition; weapons systems being replaced or upgraded less frequently; quantities of weapons bought decreasing; and per unit cost increasing. For example, a weapon system's cost increases significantly when it cannot be produced in an efficient quantity. Buying small quantities using current research, development, and production methods is roughly equivalent to producing the entire quantity as handmade prototypes. Spreading the research and development costs among systems being made in small numbers makes each unit's cost appear exorbitant. Use, maintenance, salvage, and other support of these systems will be equally costly. The acquisition of the B-2 bomber for the Air Force is a perfect example of what can happen to the per unit cost as the planned buy decreases. Major General Croker, Air

Force Director of Strategic, Special Operations Forces and
Airlift Programs, said:

Critics tend to focus on the bomber's cost. And addressing this issue -- what the media calls "sticker shock" -- remains one of the most difficult myths to dispel. In terms of dollars we've expended, the testing we've done, the amount of time and energy we've put into the program, we're about 55 percent through the entire program. By the time we pay for the first 15 aircraft we will have spent 65 percent of the dollars. In fact, the last 60 airplanes will cost less money than the first 10.⁶

Despite this, Congress has reduced the original order for 132 B-2s to 75, and it appears to be leaning toward funding only the 15 planes now being built."⁷

Technological Lead

The U.S. lead in critical technologies is decreasing. Leads in these technologies are key to insuring the U.S. can dominate the battlefield in the absence of large military forces.

Secretary of the Air Force Donald B. Rice, in describing a future dilemma, said, "We are rapidly moving into an age in which the other guy will get his shot off before the missile impacts him, and the result of that engagement is that both of you are dead...this is untenable."⁸ A DoD assessment shows that of twenty critical technologies, the Soviet Union is equal to or leads in four, NATO allies are equal in seven, and Japan equals or leads in eight. That assessment specifically shows Japan ahead in five critical areas; rapidly advancing in many; and continuing to expand rapidly its industrial base to produce products resulting from technological advances.⁹

Obsolescence

Changes in the rate of obsolescence and quality are increasingly important to programming, development, production, and replacement of systems. First, systems are becoming obsolete long before they wear out from use, and product quality demands are routinely increased. These improvements reduce the cost of maintenance and lengthen the useful life. Rapid improvements made by competitors and adversaries quicken the pace of product obsolescence. The product still works to specification but doesn't meet the higher needs or expectations of the customer. A commitment to replacing obsolete equipment is essential to achieving a well-equipped, capable force.

Reconstitution and the Industrial Base

"Reconstitution...may prove to be a hole in the strategy, as it depends in large part on a defense industrial base that may not be there when the time comes."¹⁰ The successes of Desert Shield and Desert Storm gave many the impression that the U.S. could provide anything that was necessary to support the war. In fact, the U.S. had unusual advantages in this confrontation. For example, the U.S. foreign suppliers supported the U.S. The U.S. also had five months of preparation time and excellent levels of wartime stocks and equipment resulting from long-term production efforts. Regardless of these advantages, shortages began to appear. If it had lasted much longer, real problems would probably have developed.¹¹ Considering current programming

actions, the military will be less capable of handling a similar conflict in the future, especially if some of the advantages mentioned above, are not present.

The industrial base may have trouble supporting the force in surge situations which are less demanding than reconstitution. Surge requirements can be met with existing facilities and equipment by accelerating production, maintenance, and repair of selected items to meet contingencies short of a declared national emergency.¹² Desert Shield and Desert Storm, in a future context, without the advantages mentioned, could be plagued by severe shortages. The surge described by the media during that operation was merely a speedup of items already in the production system. Except for small items and consumables, little expansion of production had occurred. The spare parts and munitions stockpiled to counter the Soviet threat, but used in this operation, averted many critical shortages. Additionally, forecasted budget reductions will force reduction in stock levels for spares and will make upgrading stockpiled spares even less likely.

Fortunately, foreign suppliers supported the U.S. in Desert Shield and Desert Storm. General Charles C. McDonald, Commander of Air Force Logistics Command, said, "If the foreign suppliers had chosen to cut us off for political reasons in those few cases where they were the sole source, we might have had trouble recovering."¹³ While the U.S. should be able to rely on its allies in most situations, the decreasing importance of the U.S.

as a superpower may increase situations where suppliers might prefer to stay completely outside of the conflict, even in a business sense.

A reduced number of defense contractors is forecasted for the future. Some of the factors which may influence defense contractors to reduce or eliminate defense relationships and move into commercial enterprises are: reduced profits (in many cases, losses); less government sponsored research and development; reduced quantities and types of systems bought; increased government regulation and oversight; and erratic budget authorizations for defense. This assessment is supported by Lockheed Chairman Daniel M. Tellep in his description of the state of the defense industry:

U.S. defense firms...have written off \$5 billion in the last few years alone on fixed-price development contracts. Whipsawed between painful government contracting rules and diminishing profitability of the defense business, the industry for the first time sees the emergence of genuine concerns for the financial health of our industry and the ability of this nation to sustain an adequate defense industrial base.

Stockholders' expectations of reduced profitability of the defense industry have significantly reduced the industry's financial market value. Decreased market value, in turn, leads to reduced availability of capital to fund new projects or complete existing ones. This makes the industry's financial health as important as technological improvements to achieve a capable, readily available reconstitution capability.¹⁵

In addition to anticipated U.S. mergers of defense contractors, U.S. defense contractors may consider mergers or

sales of part or all of their company to foreign corporations. McDonnell Douglas, for example, may be coordinating a deal to sell part of its company to a Taiwanese corporation. This could give an Asian country a significant boost in aeronautical engineering technology, one of the few areas where the U.S. still has a substantial lead. While the U.S. government should be able to keep critical military technology elements from getting into foreign hands, it remains a risk. Further, as defense contractors decrease, competition for contracts decreases causing a continuing spiral toward less efficient, more costly systems.

Complications Effecting Strategy Development

Except for crisis situations, developing and implementing strategy in the U.S. is complicated by the numerous groups which must cooperate to accomplish it. For example, the Bush Administration opposes industrial policy. It prefers to let the market decide winners and losers and wants no part of government-industry collusive practices like those established in Japan by the Ministry of International Trade and Industry (MITI).¹⁶ While many consider the free market economy part of U.S. tradition, it is extremely difficult to have a completely free market defense industry. This industry has only one major customer for its most advanced systems, that is, unless the U.S. wants these systems to be part of their potential adversary's arsenal. Although the risks associated with selling weapons systems to foreign countries can be reduced somewhat by several methods, such as

controlling spares, the sales do increase the risk to U.S. forces. A former executive to McDonnell Douglas Corporation, Mr. Ralph Hawes, said, "Defense does not operate in the free market. It is a monopsony situation, with a single buyer that makes the rules, not a free market situation at all."¹⁷ The defense industry which makes advanced systems, to some degree, is different from other industries. While it can operate more like a business than a government agency, its inability to freely develop, market, and produce its products forces it to have some special status in the economic system. Without this special treatment, it will likely be unavailable or ineffective when needed. Waiting for a crisis to force political consensus on how to support military-industrial-economic needs could result in disaster during a major combat operation.

Strategy related to military, industrial, and economic planning is further complicated by the number of participants, political interests, branches of government, and taxpayers' expectations. Development and implementation of a comprehensive long-term U.S. economic strategy is unlikely, because once presented, people will want to measure its success. U.S. politicians and business leaders tend to focus on the near term because of the relatively short election cycles and the need for business executives to demonstrate success to stockholders and corporate board members on a quarterly and annual basis. The media's concentration on current events intensifies this short-term focus. There is also a basic mistrust by the U.S. populace

that industry and government collusion will put the people at a disadvantage. It is also difficult to measure and make accountable actions of senior officials because of the size of government. Together, these factors pose an extreme dilemma in developing a meaningful strategy.

Government Regulation

U.S. industry sometimes has great difficulty competing with foreign manufacturers, especially those from Japan which has exceptional expertise at developing and producing technical or electronic commercial products. Frequently, this is blamed on U.S. manufacturers allegedly not having an equal opportunity to sell products in other countries and other countries' ability to sell their products in the U.S. for less than the cost to make them. Regardless of the reasons cited, the U.S. has lost market share and has limited capability to become competitive in producing some items, such as liquid-crystal displays for computers. U.S. manufacturers do not have the production experience or knowledge to mass produce this particular type of electronic gear efficiently. Because of this, there is no significant manufacturing capability in the U.S. to support expanded U.S. defense requirements for this product, should it be needed. The U.S. is so far behind in this technology, it would take significant efforts to create this capability. If U.S. production capability for this type of equipment does not increase and foreign capabilities do, U.S. production sources

will continue to decrease, and U.S. manufacturers will be completely out of this business. U.S. anti-dumping laws which increase taxes on these imported products haven't improved the situation because there is little to no U.S. capability to protect.¹⁸

The defense industry has also lost efficiency and increased costs because of excessive regulation and litigation, which in turn, has made government-industry interface more confrontational. While competition is often considered a means to force efficiencies and reduce costs to the consumer, implementation of the concept in government-industry relationships doesn't seem to have achieved this. Defense executives cite excessive regulation and oversight and indecision for creating an adversarial acquisition climate.¹⁹ Mr. Bernard L. Schwartz, chairman and chief executive officer of Loral Corporation, said, "I cannot hire auditors and lawyers fast enough, while at the same time I am forced to lay off scientists and engineers."²⁰ Although Defense has made efforts to reduce this friction and inefficiency, more will have to be done as research, development, and production money decrease.

Investment

Investment in the U.S., both inside and outside the defense industry has been declining. In the 1980s, U.S. business investment grew at an average annual rate of 3.3%, versus 8.5% in Japan. Additionally, U.S. public spending on infrastructure fell

from 2.3% of gross national product in the 1960s to 1.3% in the 1980s.²¹ Investment addresses not only the short-term need to speed up the recovery; it also deals with fundamental long-term problems such as weak productivity and loss of U.S. competitiveness. The investment trend is disconcerting because it has been a long-term change, and only recently, does it appear, Congress will make the effort to support investment through funding infrastructure projects such as interstate highway building and repair.

Reaping the Rewards from Creativity

Being first at developing new products has always been a source of pride in the U.S. The U.S. commitment to giving people credit for their inventions or ideas and enabling them to reap some of the benefits for them seemed to be the engine of creativity. Recently, however, the U.S. patent system seems less capable than those of Europe and Japan to support rapid product development and manufacturing followed by successive levels of product improvement and manufacturing. Corporations outside the U.S. seem to be creating at a feverish pace, enabling them to put more new products on the market faster. Foreign corporations are also gaining knowledge of the U.S. patent system; appear to be taking the lead in obtaining patents in high-technology areas; and are boosting their percentage of U.S. patents every year. Some U.S. executives are concerned that foreign competitors may be making patent gains in areas where they can dominate the world

market. James W. Gillman, general patent counsel for Motorola Inc., indicates that efforts to gain intellectual property rights have increased significantly as demonstrated by Japan's sharply increased patent filings over the past five years.²² The U.S. is able to invent first but produce commercial products second. In the long-term, this results in lost market share and lack of industry to produce it. This is an unacceptable trend considering the necessity for a substantial industrial base. While the need to protect the inventor or creator remains important, the U.S. patent system may need to change to increase opportunities for profitable U.S. production.

The significant differences between the U.S. and Japanese patent systems cause this problem. U.S. laws dissuade copycats and help protect inventors' ideas until patents are won. Japanese laws are used to promote technology-sharing, with little value placed on ownership. Therefore, the Japanese often exploit U.S. inventors under the Japanese patent system and profit from sales of the products within Japan and around the world. Japan does not consider this wrong. U.S. law grants a patent to the person who proves he had the idea first, regardless of filing date. U.S. patent applications are secret until the patent is granted, which may be eighteen months to several years. To strike a balance between innovation and competition, patent owners get a 17-year monopoly on inventions but must share their work with the public. Japan uses a first-to-file system and makes patent applications public 18 months after they are filed,

enabling the research to be used and advanced earlier. While the U.S. system protects inventors who lack the resources to rapidly work through the patent process and prove their claim, some believe the system actually stifles competition and leads to redundant research.²³ The problem appears to be not of how fast U.S. inventors can invent, but rather how fast the invention can be produced, marketed, and improved upon, which in turn starts a new cycle of marketing and production.

Conclusion

Overall, the U.S. continues to hold a substantial but shrinking lead in most critical technologies required for national defense. Unless the U.S. changes its ways, continued superpower status is unlikely, especially in terms of the technical and manufacturing capabilities need to support the military and the economy. To help identify the changes needed to reverse these trends, it is useful to review the national strategy and policies of Japan which are often used as examples of how to produce national economic, technical, and manufacturing power in a very short time.

ECONOMIC STRATEGY AND POLICIES OF JAPAN

A hallmark of Japanese national strategy is economic priority and consistency. As described by Chalmers Johnson, expert on the Japanese economy:

The Japanese state has given its first priority to economic development. This does not mean it has always been effective in achieving its priorities..., but the consistency and continuity of its top priority generated a learning process that made the state much more effective...A state attempting to match the economic achievements of Japan must adopt the same priority as Japan. It must first of all be a developmental state... This commitment to development does not, of course, guarantee any particular degree of success; it is merely prerequisite.²⁴

Economic growth and power have been Japan's primary goals, and it developed a long-term strategy to achieve them.

The Japanese economic strategy has been guided by several long-term policies. First, Japan provides its private sector wide latitude in its business practices, including the ways businesses are allowed and encouraged to pursue foreign technology transfer and produce and sell products resulting from this technology.²⁵ While foreign technology was the mainstay of the Japanese system for decades, there was also an associated effort being conducted inside Japan. The Japanese Official Development Assistance (ODA) agency was expanded consistently to support Japanese internal research and development efforts. Japan thereby developed a viable and fast growing technical capability which enabled it to develop more products and manufacturing expertise of its own. In the 1985 Japanese "White

Paper on International Trade," Tshusho Sangyosho described this strategy as:

Japan's aim of shifting from dependence on imported technologies to independent, creative technological development can best be served by 1 - the creation of an environment that will provide ample scope for private entrepreneurship, 2 - government research and development in fields which would present excessive difficulties for private companies acting alone, and 3 - active contributions to the international community through R & D and the spread of its results.²⁶

This strategy has been extremely successful. The Japanese government in some ways is doing the same thing U.S. government does, only in this case, Japan does it as part of a comprehensive national economic strategy. The U.S. performs most of these support efforts as part of a national defense program as opposed to an economic program.

Significant elements of the Japanese strategy include: increasing the quality of its products, increasing the Japanese market share of world production, and increasing productivity. Each part is instituted in the Japanese culture and government-business structure, and in turn, each element increases the effectiveness of other elements in a continuous, cyclical fashion. Additionally, the Japanese strategy has a long-term orientation. While the effects of these practices may not be significant individually, when combined, they give Japan a substantial competitive advantage in international business.

Cooperative Effort Led by Government

First and foremost, Japan's government is the central factor

in orchestrating the long-term, cooperative effort between Japanese government, its businesses, and its people. Japan's economic success is attributed to a brilliant industrial policy that guided and assisted the private sector and shielded it from foreign competition. The key players in this effort were Japan's Finance Ministry, Bank of Japan, the development banks they created, and the Ministry of International Trade and Industry (MITI).

It's difficult to get hard facts on how these government agencies are related to each other and do business, because it is virtually impossible to trace their actions in the government budget.²⁷ However, some historical facts and principles have been verified. For example, MITI grew from the Ministry of Munitions, a government agency which guided the Japanese military-industrial complex, into a powerful government agency to guide the more comprehensive government-business-finance-industrial complex. As a commercial enterprise becomes more effective and powerful, less guidance is provided by the government, and business accepts less guidance and interference. Japan's unique approach created an elite cadre of highly motivated bureaucrats to make key industrial policy and manufacturing decisions based on economic and technical criteria and national interests.²⁸ In conjunction with the Finance Ministry, MITI exercises extensive influence, both formally and informally, over financial markets, business leaders, and the public. The scope and authority of the Japanese bureaucracy is

overwhelming compared to that of the U.S. Chalmers Johnson describes some of these capabilities as:

...a panoply of market-conforming methods of state intervention, including the creation of government financial institutions, whose influence is as much indicative as it is monetary; the extensive use, narrow targeting, and timely revision of tax incentives; the use of indicative plans to set goals and guidelines for the entire economy; the creation of numerous, formal, and continuously operating forums for exchanging views, reviewing policies, obtaining feedback, and resolving differences; the assignment of some governmental functions to various private and semiprivate associations (JETRO, Keidanren); and extensive reliance on public corporations, particularly of the mixed public-private variety, to implement policy in high-risk or otherwise refractory areas; the creation and use by the government of an unconsolidated "investment budget" separate from and not funded by the general account budget; the orientation of antitrust policy to developmental and international competitive goals rather than strictly to the maintenance of domestic competition; government-conducted or government-sponsored research and development (the computer industry); and the use of the government's licensing and approval authority to achieve development goals.²⁹

Examples of MITI's formal methods of influence include controlling the patent process, setting limits on financing technological developments, and restricting imports. MITI is often accused of picking and creating winners by using low-interest loans, access to foreign exchange, licensing, tax breaks, protection from foreign competitors, and myriad other favors.³⁰

In Japan, it is difficult to determine whether an entity is a "business" or "government agency." For example, Americans are confused when trying to identify the purpose and makeup of the Japan External Trade Organization (JETRO). It is often referred to as a "semigovernmental body." JETRO is staffed by government officials and funded by the Japanese government, and is an

operating unit of official Japanese trade and industrial administration. Many Americans feel it should be clearly labeled an agency of the government.³¹ This complex web of inter-government and business relationships enhances Japanese competitive advantages and makes it nearly impossible for most foreign companies to do business in Japan.

It is also difficult to identify MITI's informal methods of control and to quantify their impact. A MITI officer contacting a bank official to encourage finance of a particular venture that would not otherwise have been supported is but one example. Although unethical or illegal by U.S. standards, this ability to influence makes the MITI extremely powerful in determining who will receive inside information; who will get direct and indirect financial support; and what non-Japanese business will have opportunities to compete in the Japanese market. Clearly, U.S. government and businesses cannot legally engage in this type of activity, and therefore, are at a disadvantage when trying to enter the Japanese market.

Global Orientation

Japanese economic strategy is global in orientation. Japan's corporate strategy includes producing in developing countries and procuring from plants established there. This shows that, much like the U.S. did in the late 1940s through the 1960s, Japan is spreading its economic power base by increasing the production and buying capacity of developing countries.³² As

this strategy proceeds, however, Japan, unlike the U.S., continues to ensure its own markets are protected and a positive balance of trade is achieved.

Priority of Computer Technology

Japan's handling of its computer industry is another example of how Japan and the U.S. are similar, and yet different, in the ways they handle national economic interests. In a 1973 assessment, Amaya Haohiro of MITI wrote:

The Japanese Government regards the computer industry as being as important to Japan as the defense industry to the United States. The American defense industry is protected by the Buy America Act and other institutions, and it is exempted from liberalization under GATT and the code of the OECD...It has been judged that the computer industry is strategically important in the present and future industrial policy [of Japan].³³

The Japanese government views computers as the means to gain new technological and production leadership and expand existing leads. The U.S., on the other hand, usually emphasizes the need to lead in computer and other technologies and uses defense as the rationale for government support of related initiatives.

Culture

Japanese business leaders are fiercely loyal to their businesses and their country. Loyalty, in combination with relationships, be they official government, personal, business group, or labor, enhance Japanese business effectiveness, especially with respect to keeping foreigners out of the Japanese

market.

Amakaduri, translated as descent from heaven, is the practice of employing retired government officials as chief executives or members of boards of directors of public and private corporations.³⁴ *Amakaduri*, to a degree, serve as double agents. They convey their employer's wishes to top Finance Ministry officials and at the same time keep the government bureaucrats informed about their company's activities. Companies that don't support the practice of employing these people are penalized later, when they fail to get loans or financial data.³⁵

Personal relationships are also Japanese keys to success. These relationships are built over time by monetary and other favors which in most Western societies would be called bribes. For example, Japanese securities firms gave paybacks to large investors who lost money in the 1990 Japanese stock market crash. No one challenged the ethical soundness of the paybacks. The trouble came when the securities firms claimed the paybacks as tax deductible business expenses.³⁶ The inability of U.S. securities firms operating in Japan to give these kinds of favors leaves them at a great disadvantage to their Japanese competitors. While the U.S. certainly would not legally approve of similar activities, it would be appropriate to find ways in which the U.S. can compete somewhat more evenly despite national customs.

Keiretsu is the Japanese structure of industry groupings, an

oligopolistic organization of each industry by conglomerates.³⁷ Keiretsu influence is exemplified by how Subaru's economic difficulties are being solved. Subaru has experienced serious sales problems in the U.S. in the past two years and needed additional investment capital to make necessary improvements. Because of this, Fuji, the parent corporation paid \$66 million to acquire most of the remaining Subaru stock and Nissan provided additional funds to support both Fuji and Subaru. Normally, it would seem odd to have one major automobile company help another. However, Nissan, in this case, is one of Fuji's largest shareholders and a fellow member of the Industrial Bank of Japan Ltd. keiretsu.³⁸

Foreign enterprises have an extremely difficult time gaining a foothold to operate fairly in Japan because of these loyalty and relationship factors. "While long-term relationship may be efficient, they are also inevitably exclusionary. So foreign businesses entering Japanese markets complain that they cannot gain admission to the club."³⁹ U.S. corporations, for example, must still obey U.S. antitrust laws which the keiretsu are obviously able to disregard. They also cannot pay bribes, and must somehow find a way to develop long-term relationships in the short-term.

The Japanese people are fiercely loyal to their country and the companies they work for, and, they are willing to work long hours in a cooperative effort to improve the productivity of the business. These appear to be positive aspects of a very

productive society willing to forego personal interests to support the common good of the nation and the company. However, this loyalty can be taken so far as to informally block the free and fair movement of workers among companies for better wages and benefits as described earlier. This environment, in effect, also limits workers' freedoms and capabilities to make a better life for themselves and their families. Attempts to transfer to other companies or reject seemingly immoral business practices is considered inappropriate. This, in turn, tends to prevent illegal or unethical business practices or worker problems from being identified and resolved. When a scandal does occur as it did in the stock market and finance scandal, the people who lose the most are the small investors. When the market fell precipitously, big investors were compensated by the large investment firms, the small investors received nothing. While loyalty is a sought-after attribute, ethical business practices and worker rights are considered essential factors in the U.S. Therefore, it is unlikely the U.S. could engender an extreme Japanese-like company loyalty in the U.S.

According to Alan Blinder, Professor of Economics at Princeton University:

The Japanese seem to have broken down the "us versus them" barriers that so often impair labor relations in American and European Companies. They do so by creating a feeling that employees and managers share a common fate... To a significant degree, Japanese workers cooperate because their welfare is tied up with that of the company.⁴⁰

This feeling motivates the work force and is a key factor to long term progress. Japanese people often start with and retire from

the same company after many productive years of service. Long-term employment influences the company to invest in more employee training because the individual is likely to repay the company in the long-term through increased productivity.

Total Quality Management (TQM)

TQM is the centerpiece of improving Japanese industrial productivity. This process, as initially developed by Deming and Juran of the U.S., has been fanatically embraced by Japan and has been improved based on the Japanese experience. This process continuously guides management and subordinates toward improved quality, productivity, and creativity while giving both supervisors and subordinates greater feeling of participation, worth, and importance. Japan views the process as a way to help workers while the U.S. views it as merely a way to improve productivity, in many cases, reducing the work force while completing productivity enhancements.

Conclusion

The combined influences of cooperation among Japanese government, business, and the people have a synergistic effect to improve Japanese competitive capabilities. Each element inhibits foreign capabilities to compete in the Japanese economy. Only the largest U.S. corporations would normally have the resources to combat these formidable hindrances, and only then, with substantial backing from the U.S. government. The combined

effect is exacerbated for foreign trading partners because of their misunderstanding of Japan's inner workings and Japan's efforts to keep their economic practices misunderstood.

The U.S. culture, vastly different from Japan's, would likely preclude adoption of Japanese strategies and policies. Overwhelming loyalty to a business, as exhibited in Japan, is not considered a probable cultural change for U.S. industry-worker relations. Instead, the U.S. should consider variations of Japanese economic strategies and policies that can reasonably be instituted in the U.S.

U.S. GOVERNMENT AND INDUSTRY INITIATIVES

While government leadership is often considered an essential ingredient to making the U.S. more competitive with Japan, some view government as part of the problem in that its influence and support has made companies weak. T.J. Rodgers, Chief Executive Officer for Cypress Semiconductor,

...calls large computer chip companies dinosaurs. He accuses their executives of whining for political protection rather than innovating and investing. He complains that current government policies are designed to prop up sagging companies. And he derides Sematech, the government- and industry-funded consortium intended to restore America's edge in semiconductors, as a corporate country club for big business.⁴¹

Rodgers contends that in the long run, Japanese government will slow or stifle Japanese business and the U.S. system of entrepreneurship and venture capital investment will win in the end if not stifled by the U.S. government. He further argues:

U.S. companies should not build huge plants in an effort to go head-to-head with the Japanese, who have cheap capital and government support. Rather, American companies should stay small, exploiting their unique design technology and unsurpassed system of venture-capital-backed entrepreneurialism to maneuver around the slower-moving Japanese.⁴²

Rodgers backs his arguments by a rapidly growing semiconductor company which has expanded at an extraordinary pace without any government support. However, unlike Rodgers who says he would refuse government support, most U.S. companies appear to be ready for government assistance and intervention when their company or market appears to be in the decline as was the U.S. semiconductor

industry.

Most, however, prefer U.S. government support to establish better international controls to support U.S. economic growth and reduce the trade deficit. These efforts include strengthening free trade practices and enforcing the General Agreement on Trade and Tariffs (GATT); establishing better tax incentives for businesses competing internationally; and establishing laws to prohibit industrial spying. When the U.S. is unable to achieve fair competition through enforcement of the GATT, it sometimes resorts to instituting U.S. laws. For example, anti-dumping laws were established to keep foreign companies from selling their products in the U.S. at below the cost to make the product. However, the laws don't always help, as is the case with the sixty-three percent antidumping tariff imposed on Japanese flat-screen displays for laptop computers. In this case, no U.S. producers of flat screen displays remained in the market. The net affect of the tariff was to increase the cost of U.S.-made laptops that need the flat screens. U.S. companies have moved their entire laptop computer production outside the U.S. because it became more cost effective. This example emphasizes the need to fully appreciate the ramifications of proposed protective measures before making laws.⁴³

Industrial Spying

Industrial spying is a relatively new and growing concern. Some countries do not consider industrial spying a crime but

liken it to simple research. However, spying has a more sinister result because it can virtually eliminate the profit potential of U.S. technical improvements which have been funded by U.S. companies and citizens. A company or nation that steals the information may be able to forego much of the development and testing of the product and because of that, be able to bring it to market at less cost, and at about the same time as the U.S. company. Some have suggested that the U.S. Central Intelligence Agency should be tasked to "ferret out foreign collusive practices that harm U.S. corporations, and work to thwart theft of U.S. technology and trade secrets by foreigners."⁴⁴ While this type of intelligence gathering may be warranted in a few situations, widespread use would become counter-productive. This is because, like trade barriers, each time this type of effort is encountered, others can enter the effort to protect their interests; a continuously increasing rate of spying could result with no winners. Each nation would end up spending more on this type of work without any increase in overall (global) productivity.

Cooperation Versus Competition

Multi-company research efforts can be accomplished in a cooperative activity like that being tried by Sematech, a partially government financed entity supported by several U.S. manufacturers in an effort to make a quantum leap in computer chip processing speed. This effort is somewhat similar to the

Japanese government coordinated efforts to advance specific critical technologies. In the U.S., close government-business relationships, other than for defense, go against traditional U.S. beliefs that government and business should be separate. This is because extremely large companies are believed to have the capability to control a particular market and take advantage of their positions at the expense of the consumer and taxpayer. Additionally, some believe in the long-run, large companies, especially government-supported or sponsored ones, are less efficient than those who have to compete in the market. U.S. antitrust laws were enacted to preclude or counter the potential effects of these capabilities. But most believe the situation is much different now than when antitrust laws were passed, and the laws may have to be changed to accommodate U.S. needs to compete in the global economy. Each of the arguments concerning the proper amount of government influence and support and the proper size and influence of companies must be assessed thoroughly to ensure major changes in law don't make the situation worse. Brian Bremner, columnist for Business Week, describes the dilemma this way:

The Bush Administration today confronts a radically different global arena than its predecessors. Policymakers are trying to balance two competing economic goals: How best to give U.S. companies the financial strength, operating efficiencies, and global reach to carry their weight abroad. And how to do so without smothering the healthy effects of robust domestic competition, such as sharp market instincts, a vibrant supplier base, and quick product-development cycles.⁴⁵

Despite the dilemma, U.S. companies have begun to compete

internationally in ways that would have been considered counter to U.S. antitrust laws a decade ago. As exemplified by Ford Motor Company, many U.S. companies have started cooperating and integrating both vertically and horizontally, including their suppliers, competitors, universities, and research labs, to name a few.⁴⁶ These keiretsu-like moves are helping U.S. companies become more competitive in a global economy, in research, design, financing, production, and marketing. The U.S. style keiretsu are similar but not the same as Japan's. The reason the government is not enforcing antitrust law as in the past is the government sees no other reasonable way for U.S. companies to compete globally. The need to advance technological breakthroughs at an ever-increasing pace; produce customized complex products in a few days; and fund the spiraling costs of research and development contribute to the government's more understanding position. Deborah L. Wince-Smith, Assistant Commerce Secretary for technology policy, said,

Tomorrow's keystone technologies are so expensive to nurture that U.S. companies cannot commercialize them without banding together and sharing the risks. This is especially true given the compressed time frames within which new products must get to market.⁴⁷

U.S.-style keiretsu do not appear to have taken on the negative factors which would definitely result in antitrust action or a new law to block them. Instead, the U.S. businesses intend to build something better, in effect, enhancing collaboration to reinforce capitalism. The innovative qualities of U.S. suppliers, more than their Japanese counterparts, could help

build an industrial system technologically stronger and faster than Japan's.⁴⁸ The U.S. government remains cautious with respect to how these events will evolve and help or hinder U.S. economic growth. However, as currently evolving, U.S. business appears to be taking a calculated and logical approach to achieving competitive balance with its Japanese counterparts.

Infrastructure

Some consider recommendations for federally funded information highways (such as fiber-optics cable systems that could support fast transmission of massive amounts of information) to be national infrastructure, as has already been decided in Japan.⁴⁹ This system will be needed, federally funded or not, to support future fast communication and cooperation requirements for manufacturers, their suppliers, and customers, and could lead to myriad opportunities. The information highways are foreseen as essential links to increasing business productivity in design, production, and marketing. Federal agencies have been researching the feasibility of an information highway that would link scientists, schools, supercomputers, and libraries. The goal would be to expand an existing science network into a high-capacity information superhighway, called the National Research & Education Network.⁵⁰ While this approach appears to be a good start, there doesn't yet appear to be a plan for a national infrastructure to expand it to meet business needs. The main issues surrounding the current proposal are how

much the government should be involved and whether the users pay for it? As the U.S. debate continues, there are signs that Japan has already decided to provide this support as part of its national infrastructure, that plan primarily addresses business needs.

Another potential type of infrastructure funding involves technology, especially funding involving critical technologies, such as the processing speed of computers. The U.S. has expended funds for decades on these technologies but does not in the traditional sense count it as infrastructure funding. The defense department, in many cases, is the lead agent to develop these technologies both for military and other purposes.

Manufacturing Expertise

One positive trend to improve U.S. factory productivity has been the increasing employment of individuals with advanced business degrees in manufacturing. For the past two decades, the trend has been for these graduates to stay in the finance and marketing fields where monetary rewards were higher. Now these graduates are tending more towards the factory floor where they can more readily see the results of their work, and some companies are reinforcing the trend by increasing the monetary benefits for manufacturing related work. Manufacturers are already seeing the benefits of this infusion of highly talented individuals. The major business schools have also become interested in the change. New manufacturing related advanced

degrees are being developed or increased at major business schools. For example, an innovative program known as Leaders for Manufacturing at Massachusetts Institute of Technology is aimed to mold technically oriented students into executives who can revive America's competitiveness on the shop floor.⁵¹

Industry and TQM

Two efforts resulting from TQM have evolved at Motorola and are excellent examples of how to stay competitive and eventually lead in international markets in technical fields. In fierce competition with Japanese companies in the cellular phone, semiconductor, and pager businesses, Motorola succeeded by using quality as its principle concept. The company spent heavily on capital improvements, research, and employee education to recapture markets and has set its goal as "six sigma quality-- statistical jargon for defect-free manufacturing."⁵² Motorola also expended great effort in speeding up design and manufacturing processes. Intravartolo, Motorola manufacturing manager, said:

Rather than design the product and then test whether it can be manufactured, as many companies do, Motorola made the process seamless. Manufacturing staffers sat in on product-design meetings, and vice versa...Redesign work that would have taken three weeks elsewhere was done in two days because design and production staff sat down and solved a problem whenever it came up.⁵³

This process which is widely used in Japan is being improved upon in many companies to the point where some of the testing of products or ideas is being done via computer simulation for

manufacturing, operation, and marketing as the products are being designed. This process can significantly reduce design to production time and reduce potential quality problems and cost.

DoD Acquisition and TQM

While some TQM successes have been noted in the public sector, none could be considered a roadmap for success for a huge public sector commitment, especially one with mission and size of the DoD. In practice, the DoD acquisition system extends far beyond the DoD, and includes other parts of the executive department, Congress, and industry. The challenge is to influence this group of diverse organizations to adopt TQM as its culture.

Traditional methods of keeping the acquisition process under control, such as tight, top echelon control and congressional review, actually hinder efforts to implement TQM. This is because a major pillar of TQM involves giving up some of the authority from the top echelons and empowering lower echelons to change the methods and environment in which they work and make decisions. For example, while DoD Directive 5000.1, Defense Acquisition, clearly supports empowerment and accountability in principle, it may not in reality give the power or the tools to achieve success.

Empowerment, cooperation, and participation are keys to TQM success. A primary method of empowerment is to decrease non-essential layers of supervision. If a layer of supervision will

not significantly improve productivity or decisionmaking capacity, it should be deleted. Additionally, TQM is based on cooperation and participation among the various elements to achieve the common goal as opposed to competing for parochial or political interests, an extremely difficult goal considering the complexity of the DoD acquisition process.

TQM implementation difficulties are exacerbated in the DoD acquisition process because TQM is a long-term, continuous approach that must be emphasized in word and deed from the top down. It impacts every person and every thing. The standard annual policy letter or directive won't do the job. This deserves emphasis because the culture change required to achieve success with TQM is a formidable, endless task. TQM is a long-term means to change our culture and must be adopted as such by the senior leadership, from the heads of the departments of the government to the people who make the products needed to accomplish the DoD mission.

Although not accomplished under a heading of TQM, several TQM-type changes were initiated by the Packard Commission, Goldwaters-Nichols Reorganization Act of 1986, National Security Decision directive (NSDD) 219, and the Defense Management Review (DMR). The DMR caused a "renovation of the acquisition chain of command and creation of the posts of Program Executive Officers (PEOs), who were assigned the task of overseeing groups of major programs."⁵⁴ Acquisition programs which would not have been cut under previous government processes have been cut because of the

increased authority and responsibility of senior acquisition officials, including the Secretary of Defense. While some problems remain with assigning responsibilities and holding those responsible accountable, strides have been made, and the leadership recognizes the need for further improvement.

Mr. Jon Betti, former Undersecretary of Defense for Acquisition and a DoD proponent of TQM, directly associated the TQM process with acquisition improvement initiatives. He described the importance of understanding TQM as a concept before attempting to employ specific TQM techniques and tools. He defined the four basic pillars of TQM as: customer responsiveness, continuous process improvement, people (for their knowledge of the process), and quality (as defined by the customer). This requires an educational component, an understanding of the techniques necessary to engage in process improvements, and a change in culture.⁵⁵

Considering the above, successful implementation of TQM in the DoD acquisition process is possible if powerful, long-term steps are taken. Examples of some powerful steps already being taken by the DoD include:

- 1) DoD is taking action to consolidate defense laboratories to make them more efficient. The Navy is consolidating research in four warfare centers; the Army proposes to centralize lab management into one research center; and the Air Force is creating four "superlabs" from fourteen existing laboratories and research facilities. This is part of an initial long-term

proposal to streamline management of lab resources and reduce costs.⁵⁶

2) DoD has worked to reduce military specifications and standards and bring them, where possible, more in line with commercial standards. This makes it easier to accomplish research, development, and production which can satisfy military and commercial interests. This factor will make expanding industrial production to support military surge operations more viable.

3) The DoD and other government departments have made significant improvements in how automated systems are managed, operated, and improved. Traditionally, government and industrial automation programs were built individually from the ground up. Tasks to develop quantum or evolutionary improvements were given to new offices and new programmers to accomplish. Because of this, standardization of process was more difficult and programs or portions of programs which had been fully tested and successful were not very useful in later generations of programs. The government and industry have since made extensive efforts to centralize automation requirements and to reuse parts of programs in a building block approach. Successful program parts (often called subroutines) can then be used in numerous programs. Additionally, automation requirements of departments or agencies which have similar requirements can often be consolidated, or at least, operate under the same system. This was accomplished for the military pay system, which until recently, operated under a

separate system for each military department. With the change, redundant systems are eliminated, supporting resource requirements are reduced, and automation program updates or improvements can be done for one system vice three.

4) Under various elements of the DMR, similar consolidations of effort and decision authority, beyond automation, have been made in contract management, intelligence, depot maintenance, supply systems, and acquisition. A stifling element of the defense acquisition process has been the extraordinary level of military specifications and regulations. Under DMR scrutiny, 14 percent of military specifications and standards will be canceled and 76 percent of acquisition directives and instructions will be eliminated or substantially revised.⁵⁷ Each of these efforts streamlines government operations and makes them more efficient and effective.

Defense Advanced Research Project Agency (DARPA)

One of the most effective government efforts to keep the U.S. at the leading edge of technology has been exercised by the Defense Advanced Research Project Agency (DARPA). This agency is DoD's central research and development organization and is responsible for maintaining U.S. technological superiority over potential adversaries. DARPA directs basic and applied research and development projects that exploit scientific breakthroughs and demonstrate the feasibility of revolutionary approaches for improved cost and performance of advanced technology for future

applications. While the current names of U.S. weapons do not normally carry their original DARPA project titles, many of the successful systems are based on technologies started by that agency. Examples include stealth, ultra-fast computer chips, surveillance systems, imaging systems, and combat and support management software.⁵⁸

Several acquisition actions were taken during Desert Shield and Desert Storm which showed the DoD acquisition support of high technology systems can be effective in limited situations. Examples of these include "developing, testing, and deploying an entirely new 4,700 lb. deep penetrating bomb (the GBU-28) for use by F-111F's against high-value buried targets in just seventeen days"⁵⁹ and early introduction of the experimental JSTARS E-8A theater surveillance aircraft into combat operations. These systems proved devastatingly successful despite the limited experience with and testing of them.

While many DARPA-led and other defense programs have been extraordinarily successful, related commercial aspects of the programs have not yet achieved their full value. U.S. companies, including those that are involved in the DARPA supported research efforts, appear to lag in their efforts and capabilities to develop and market commercial uses for variants of these technologies. Any delays in production and marketing allow potential foreign competitors to gain that knowledge through legal and other means to achieve parity with U.S. technology and potentially lead in production of the related commercial

products. Part of the problem is that leading edge technologies are not normally those the U.S. wants to readily move to commercial markets for sale and may frequently be classified. Additionally, most systems, if passed to a competitor or potential military adversary, can be quickly reverse engineered and give them the same capability as the U.S. While this seems an extremely difficult problem, it appears to be in the national interest, especially economically, to influence U.S. commercial industrial capabilities to develop and sell products at the leading edge of technology. If the U.S. doesn't other countries will, and if successful, will reap the economic benefits of their actions.

Conclusion

Overall, numerous assessments show the U.S. gradually progressing in productivity and quality. However, the progress is not fast enough to continue or regain leadership in several critical technology areas. Additionally, more disturbing concerns arise for U.S. manufacturing prowess in high technology areas. The capability to develop, produce, and market high technology products is not one in which the U.S. can accept high risks either in national military, economic, or industrial matters. Loss in any of the areas could lead to significant losses in the other elements of national power.

PROPOSED MILITARY-INDUSTRY-ECONOMIC STRATEGY

This section highlights several elements of a U.S. Military-Industrial-Economic strategy to maintain long-term military technological strength while at the same time ensuring a strong industrial and economic base. Although not the only elements of national power, these three are essential to continued superpower status of the U.S. Also, when combined, these elements can produce a synergistic effect which can increase national power significantly. This section provides a proposed national strategy to enhance future prospects of continued U.S. superpower status. Each recommendation is presented in consideration of the discussion presented in previous sections. Special emphasis is placed on what government (predominately those matters within the power and authority of Congress and the Executive) must do as the orchestrator of planning and action to achieve national goals. The proposals are not easily implemented, yet, if they can be, I believe they offer exceptional potential for long-term success. Each proposed strategic element is described in general terms (denoted by ✓) followed by the associated rationale (denoted by □).

Provide National Strategic Guidance

- ✓ Develop statement of long-term (10 years) national strategy approved by both the Congress and the President.
- ✓ Create nonpartisan professional bureaucracy outside the direct,

routine influence of the Executive and Congress to perform the following functions: monitor and provide advice on national and international economic matters; recommend changes to tax, trade, and other laws; incorporate Federal Reserve Board responsibilities; make limited monetary and taxation changes under own authority.

✓ Consolidate committees related to economics (e.g., budget, finance, appropriations, etc.) into one committee each at the Senate and House of representatives and one joint congressional-executive committee to review and make recommended law and budget changes to Congress and the President.

✓ Create new office in the Executive, on the same level as the national security advisor and staff, to have responsibility for managing and coordinating economic matters for the President, including budget oversight of the Office of Management and Budget and the departments and coordination with the congressional economic committee and the separate non-partisan professional bureaucracy, both mentioned above.

□ Rationale: These national strategic guidance elements help the Executive and Congress work from the same strategic document on a long-term basis (spanning election periods). It also provides a professional bureaucracy, somewhat similar to Japan's, which is predominately national versus political party oriented. It is also capable of some limited action without specific approval of elected officials.

Embrace TQM as a National Imperative

- ✓ Establish long-term top level commitment to TQM in and outside government.
 - ✓ Commit adequate resources to ensure full implementation and cultural adaptation.
 - ✓ Identify national statistical measures for success and guide future programs based on results from these measurements.
- Rationale: TQM is the process within which nearly all other reform might take place. It combines a participative management style, opportunities for improvement, and statistical measurements under a structure focused on continuous improvement. The continuous nature of the process enables it to fit a long-term strategy. TQM relies on hard-working, innovative people, a strength of which the U.S. has an abundance.

Expand and Upgrade government and Non-government Infrastructure

- ✓ Develop national goals for infrastructure capability and performance.
- ✓ Decide which types of infrastructure will be supported and to what degree they will be supported by government. Infrastructure should include but not necessarily be limited to: national standards for education, construction, operational characteristics, forward and backward compatibility, connectivity, and testing; transportation systems; communications systems; research; development; production; government (including military) structure; and a qualified, capable work force.

✓ Invest in intellectual resources in terms of scientific and engineering researchers and universities and supporting research tools such as computers with artificial intelligence capabilities.

✓ Amend federal service hiring policies to enable government to compete with the private sector for the best people.

✓ Improve management and capabilities of research and development (such as national laboratories) through centralized management, consolidation of facilities, upgrading equipment and facilities, and easier, inexpensive access by entrepreneurs, small businesses, and inventors.

✓ Streamline government methods and policies to patent, protect, test, and/or approve new products and ideas for commercial sale, including military items, especially those resulting from military-related research.

□ Rationale: In the long-term, industry and government can cooperate and work more efficiently (synergistically) together if they have reasonable and reliable expectations of each other and if government can meet the administrative needs and protection of U.S. business. For example, U.S. business can best be supported by a very capable U.S. government that can quickly (faster than other national bureaucracies) review a patent request, patent the item, test a product for safety, and protect against patent infringement. This would also help the government hire people with the training and industrial (including non-defense industry) experience in the effort to create more efficient business

practices in government acquisition. Additionally, rapid development and production of related commercial products resulting from DoD research and development would be encouraged. This would help show DoD projects assist industry beyond the direct defense contract benefits. Also, DoD costs should decrease as production costs per unit drop based on making greater quantities of related products using the same production facilities. This also makes the most innovative group in the U.S., small businesses, entrepreneurs, and inventors more competitive because they would have easier, less costly access to very capable research facilities.

Improve Financial Planning and Budgeting Process

- ✓ Extend two-year budget cycle for acquisition and eliminate rules requiring turn-in of unused funds at conclusion of a budget cycle.

- ✓ Tie the DoD acquisition budget to a percentage of the Gross National Product (GNP) and revise this percentage only during emergencies.

- Rationale: Although budgets help keep programs in line, excessive monitoring of them expends energies unnecessarily. Additionally, managers of successful organizations should be able to use the proceeds to further improve their program. The current system encourages managers to end the year with zero funds despite policy against it. This is because unspent funds implies the manager exaggerated his requirement and shouldn't get

as much the next year instead of indicating good management of the project. These proposals also reduce the tendency of participants in the budget process to fight for their perceived fair shares. It takes extensive amounts of human resources to fight the budget battles instead of finding ways to improve the product and decrease costs. This action could help focus participants' energies on making DoD productivity increases a direct and positive influence on increasing national productivity. Ultimately, this could create a synergistic effect between U.S. business, congress and the executive department to cooperate toward achieving a common goal, improvement of U.S. productivity.

Make Economy-Enhancing Laws and Related Government Policies

- ✓ Employ arbitration where possible to settle disputes rather than use courts and congress.
 - ✓ Revise antitrust statutes to enhance cooperation and cross-ownership and other horizontal/vertical relationships.
 - ✓ Use intelligence and other investigative resources to identify and counter foreign collusive and illegal acts such as spying against U.S. economic interests.
 - ✓ Establish single, centralized system for management and command of the DoD acquisition at either the OSD or JCS level.
- Rationale: This reduces the costs to resolve disputes among government, business, and consumers. While resolving disputes is essential to a free and fair society, in the process of resolving

disputes in the U.S., litigation costs have skyrocketed, slowed government and business operations, and thereby increased production costs. While layers of management in the acquisition process have been reduced significantly because of congressional and executive guidance, numerous layers of horizontal and vertical controls, management, and monitoring remain. DoD and service acquisition directives describe a streamlining of management layers, basically showing a direct line of authority relationship from the service acquisition executive to the program executive officer to the program manager. In practice, however, there are a myriad of participants engaged in the process making it extremely cumbersome, with more time being spent on justifying the program than managing it. This is because success in the acquisition process has not been defined in a meaningful, measurable way. One highly controversial example is that significant authority and responsibility over various facets of the acquisition process (including planning, concept, doctrine, and budgeting) are spread among numerous leaders and staffs of Congress, the service secretaries, service military headquarters, joint staff, commanders-in-chiefs, office of the secretary of defense, and others. Each staff has its own viewpoint and documents to prepare and review. Centralized management outside the control of the service leaders and their staffs is essential to empowering managers to implement TQM.

Reduce Major Factors Which Inhibit Productivity

- ✓ Reduce U.S. government budget deficit.
- ✓ Reduce incidence of drug-related and other crimes.
- ✓ Evaluate government research projects to include DoD projects on the basis of their ability to meet intended narrow focus goals and their potential impact on the national economy.

□ Rationale: A smaller deficit will lead to lower long-term interest rates which in turn reduce the cost of business and government investment and capital spending. Crime and drug addiction are unnecessary and substantial impediments to improving national productivity. Expenditures used to solve this problem, while necessary, siphon critical investment money away from more productive matters.

Upgrade Manufacturing Capabilities

- ✓ Develop manufacturing capacity to produce small quantities of equipment at prices roughly equivalent to mass production prices.
- ✓ Develop efficient manufacturing process to produce reasonable cost, low production rate, customizable items. This is often referred to as agile manufacturing.
- ✓ Develop standards and products which help reduce or delay obsolescence by increasing modularization, computer processor/software upgradability.
- ✓ Reduce research, development, test, evaluation, and production time by development and use of computer hardware and software (including artificial intelligence) to support these efforts.

✓ Produce items on a continuous, evolutionary upgradable basis

□ Rationale: Finding ways to efficiently produce highly technical items in small quantities is an enormous management and technical challenge. The intent of these proposals is to continually improve capabilities to efficiently produce small numbers of highly complex products through the use of extremely advanced computer systems and software, and in turn, be able to produce substantially higher quantities when needed. This has great potential for military reconstitution efforts and manufacturing custom-made products for consumers.

Global Economic Policy and Cooperation

✓ Develop and support international strategy to develop a balanced, sustainable, global economy.

✓ Encourage more foreign (especially Japan) initiative in coordinating its policies with those of the other industrialized countries in the pursuit of sustained world economic growth.

✓ Influence Japan, because of its extraordinary financial and industrial capabilities, to play a greater role in forging a more fair international competitive environment.

✓ Increase efforts to reduce international trade and finance barriers by influencing changes to GATT policies and associated enforcement methods.

□ Rationale: It would be difficult to fault the Japanese government for its valiant and successful efforts to build a Japan-first economic structure. However, this unrelenting effort

has now affected economies around the world. Japan's growth in financial capabilities and other industrialized nations' more open trade and financial markets have enabled Japan to take advantage of its influential position in those countries without affording similar opportunities in Japan. Continued wide disparities in the balance of trade could lead to extensive trade barriers, and, in turn, significantly reduce international trade and the jobs that support that trade. A concentrated effort is necessary by the U.S. and the rest of the industrial community to ensure international trade and finance barriers are reduced and administered fairly. Unless these unfair trade practices are changed, national rather than business competition for industrial strength could increase and the resulting negative reaction could cause a reduction in free trade. The best method of influence is a revision of the GATT which has been under review for years. It will take exceptional influence by the U.S. in concert with other industrialized nations to make the necessary changes.

CONCLUSION

The downward trend in defense funding will place continually greater pressure on the DoD to squeeze every ounce of strength from each acquisition dollar. Significant changes will be extremely difficult to implement in a complex environment consisting of elected officials, officials of the executive branch, industry, the military who must use the equipment, and the public who want their nation to be preserved, but to pay only a "reasonable" cost for that protection.

As the world changes at an ever increasing rate, the U.S. government must have a better grasp of the situation and its goals for the future. Government participation and leadership in the national and global economies becomes increasingly important as business operations become more global. While some believe government participation would help, others believe the government in the long run will reduce ingenuity and increase costs through bureaucratic inefficiencies. Although there's some truth in that statement, I believe government action is essential, but only to provide limited support in areas that cannot be or are too difficult to be accomplished by industry. These support activities include development and promotion of a comprehensive national strategy, which for the purposes of this study, must emphasize policies and infrastructure to achieve a strong economic and industrial base. DoD acquisition is one critical portion of the national security strategy. Because of

its size, the DoD must be seen as an essential contributor to both national military power and national economic power. DoD research, development, and acquisition projects will have to be seen as increasing the national economic well-being by supporting critical national research needs, especially in areas which have a relationship with developing and producing commercial products for international markets. It is believed that implementation of a national strategy, inclusive of many of the proposals brought out in this study would keep the U.S. economically competitive in the global market and ahead in critical technologies needed to maintain superpower capability.

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